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Coloring Matters in Foods by Albert F. Seeker. Inks by Percy H. Walker. Index.

Volume VI. Organic Bases, Vegetable Alkaloids. Philadelphia, 1912. Price \$5.00. This includes Amines and Ammonia Bases by W. A. Davis. Aniline and its Allies by S. S. Sadtler. Naphthylamines, Pyridine, Quinoline and Acridine Bases by W. H. Glover. Vegetable Alkaloids by Thomas A. Henry. Volatile Bases of Vegetable Origin by Frank O. Taylor. Nicotine and Tobacco by R. W. Tonkin. Aconite Alkaloids by Francis H. Carr. Cocaine by Samuel P. Sadtler. Opium Alkaloids by Frank O. Taylor. Strychnos Alkaloids by Charles E. Vanderkleed. Cinchona Alkaloids by Oliver Chick. Berberine and its Associates by Edward Horton. Caffeine, Tea and Coffee by J. J. Fox and P. J. Sageman. Cocoa and Chocolate by R. Whympers.

The extensive scope of the work and the pains taken to secure the assistance of experts in the various fields is well indicated by the list of chapters given.

W. A. NOYES

The Flight of Birds. By F. W. HEADLEY, M.B.O.U., with sixteen plates and many text figures. Witherby and Co., 326 High Holborn, London. 1912. 12mo. Pp. xii + 163. Price 5 shillings.

In this little book Mr. Headley has endeavored to describe briefly and clearly the flight of birds, keeping in view the methods and difficulties of those who are striving to rival them. In ten chapters he deals with methods, modes and apparatus of flight, an eleventh chapter being devoted to some accessories, circulation, breathing, etc., that are connected with, or modified by flight.

The first chapter deals with gliding, the resistance of the air, the curve of the wings and the area of supporting surface, matters which lie at the base of all flight. We then pass to stability, including voluntary adjustment, the latter a point wherein the feathered biped has the great advantage over his featherless rival of many thousands of years' experience. What man has to think about, the bird does in-

stinctively. It is this instinct that enables a bird to fly successfully at the first trial of his wings, although he can not handle them so dexterously as he will later on and they may not carry him so far nor so fast as they will subsequently. And just here may we say that a bird does not fly stupidly into a telegraph wire; he simply does not see it until too late to evade it. The *Titanic* did not run stupidly into an iceberg; by the time it could be seen she was upon it. Also horizontal wires are not within the province of the bird's instincts, and in the grouse districts of Scotland, bits of wood are hung on telegraph and telephone lines to catch the bird's eye.

In connection with the relation of the shape of the wings to stability, it may be said that Mr. Huffaker, one of Professor Langley's assistants, reached the conclusion that the curved secondaries and more or less flattened primaries of the bird's wing were the great factors in stability and that the flattened wing tips also served as horizontal rudders, points wherein man has advantageously patterned after the bird.

Then come starting and steering, and the machinery of flight, muscles and bones. A little more space, perhaps, might have been devoted to the framework and to some of the rather perplexing problems it suggests—why is it that while sailing birds, the albatross and frigate bird, for example, have very small muscles their shoulder girdles are most rigidly constructed, the coracoid, clavicle and breastbone of the latter being immovably soldered together. In the great pterodactyl, *Pteranodon*, most marvelous of all flying creatures, we have in the massive collar bone special provision for bracing the wings. Perhaps in all these cases this strength is necessary, because the muscles themselves can not be relied upon to stand the strain. But in the almost flightless hoatzin we find the apparent anomaly of a rigid shoulder girdle. We think that, as is usually done, too much value is put upon the clavicle as a brace to the coracoids. Among the birds of prey it is of importance, but in the ducks and pheasants, birds of powerful flight, it is a negligible quantity; so it is in

humming-birds and swifts, and some of the best flyers among parrots have an imperfect clavicle.

Chapter three deals with motive power, leverage, propulsion, wing stroke and the manner in which the wings attack the air, a manner well described on page 45.

Here, too, a query. Mr. Headley thinks that the kestrel can not hover unless the wind is blowing against him. We believe that the kingfisher *can* do this, and the humming-bird and hawk moth will hover above a flower and circle around it with no apparent difficulty. Mr. Headley points out that quality of muscle is quite as important as quantity, and notes that while ordinarily the elevator muscles are inferior to the depressor, in the guillemot, a swimming bird, they are on a parity. Undoubtedly his explanation is correct; the bird that uses its wings to fly beneath the water needs powerful muscles to raise them. This is in line with the deeply keeled sternum and abundant muscles of the penguin and great auk, birds incapable of aerial flight, that wing their way swiftly beneath the water.

Further chapters deal with the relation between the form of wings and mode of flight, speed and endurance and the influence of the wind. Here we find repeated the theory that soaring (circling upward) is made possible by upward currents of wind, a theory that we think few will find satisfactory. A bird may circle about in such a current, but it would not have strength enough to raise him and we feel that the most that can be said is that in some way, as yet beyond our power of imitation, birds, so to speak, screw themselves through the air to vast heights, over the level pampas as well as over the gusty mountain tops.

But one can not indulge in much discussion in little more than 150 pages and the average reader will prefer to have the facts rather than theories: and Mr. Headley has done well to give us so many facts and so much well-told information in so small a compass.

A feature of the book are the illustrations of birds, mainly pigeons, and for the most part from Mr. Headley's photographs, in

various phases of flight. These give an idea of the varied poses of the wings and tail, and their relation to the balance of the bird, or direction of its flight, that can not be gained from words.

F. A. L.

SPECIAL ARTICLES

THE EVENING PRIMROSES OF DIXIE LANDING, ALABAMA

BARTRAM's locality for *Oenothera grandiflora* at Dixie Landing on the Alabama River some distance above Fort Mimms (1778) was rediscovered by Professor S. M. Tracy in 1904 and visited a second time by him in 1907. Seeds procured by Tracy have been widely distributed and have given rise to races of *Oenothera grandiflora* which are being studied by several investigators.

Oenothera grandiflora is one of the nearest allies of *O. Lamarckiana* and seems to agree with that species in at least some points pertaining to mutability and behavior on hybridizing. Its study may at some time lead to an explanation of those phenomena which until a short time ago seemed peculiar to *O. Lamarckiana*. Consequently it seemed to us to be of primary importance to study *O. grandiflora* in its original habitat, and we visited Dixie Landing under the kind guidance of Professor Tracy, on September 26 and 27.

It had been known from cultures grown by Professor B. M. Davis from Professor Tracy's wild seed that *O. grandiflora* did not occur at Dixie Landing as a single pure strain. It was no surprise, therefore, to find growing in the old cotton fields several forms of *O. grandiflora*, together with several forms of its companion species *O. Tracyi*, which has recently been described by one of us. The plants were partly in flower and partly in the rosette condition. Neither *O. grandiflora* nor *O. Tracyi* has heretofore been known as other than annual, and the abundance of rosettes which would obviously not flower this season was therefore a point of great interest. Seeds were obtained from all strains which had ripe capsules, and in addition a large collection of